3   Research and Evaluation

The following sections present a detailed discussion of the above-mentioned data sets evaluated, the persons contacted for information (and their phone numbers), and a brief discussion concerning the scope and organizational structure of each data set that was reviewed.

Existing TSSDS Release 1.75 Flora and Fauna Data Structure

This first part of this evaluation involved generating spreadsheets presenting the existing TSSDS data structure for the flora and fauna entity sets. Appendices A and B present the existing TSSDS Structure for the flora, fauna, and wetland entity sets, respectively. Each of these appendices contains the following tables:

- Entity Types and Class Names
- Attribute Table Names
- Attributes for each Table
- Domain Table Names
- Domain Values
- Entity Symbology

These tables were exported from Microsoft Access into Microsoft Excel and were revised slightly for formatting purposes. Some of the columns were deleted so that only the primary information would be presented. The only exceptions were the third tables in Appendices A and B. These tables were generated by Baker to summarize the attributes that were used in each table, since many tables had the same attributes.

Review and Evaluation of Existing Flora and Fauna GIS Data Sets

Eglin Air Force Base

Mr. Ken Bristol (850-882-6397) from Eglin Air Force Base was contacted to obtain the EGLIN flora and fauna data sets. The Eglin data dictionary is presented in Appendix C.1 and consists of Table Names, and Attribute Names, Types, and Sizes. Appendix C.2 presents a printout of the graphical standards, where available. There are no domain values or definitions associated with this data set.

None of the Table Names and very few of the Attribute Names correspond with TSSDS Table/Attribute Names. In addition, without the attribute definitions, it is not possible to determine if the attribute may already exist in TSSDS. Therefore, a one-to-one comparison was not conducted.

Mr. Bristol indicated that the information in their data dictionary is very specific to studies conducted at their base and may not be appropriate for inclusion into TSSDS. Some of the information, however, may be useful at other facilities conducting similar studies. In addition, some of the information from these tables may be presented in a more general format to allow for use across species and facilities. As stated above, it is not possible to completely evaluate the Eglin flora and fauna data sets (i.e., data dictionary) without the attribute definitions.

Aberdeen Proving Ground

Baker and Associates (B&A) (subsidiary of Michael Baker Corporation) was contacted to obtain the latest version of the Aberdeen Proving Ground (APG) data dictionary. B&A is the primary contractor at APG developing a facility-wide GIS. The printout of this data dictionary is presented in Appendix D. The printouts also present some of the graphical standards including the level, style, weight, and color. The data sets consist of Entity Classes, Entity Names, and Entity Types are identical to those in TSSDS with the exception of a few minor differences in the Entity Names. These differences are highlighted in "italicize" in Appendix D.

APG uses the TSSDS as a template for most of its attribute tables with specific modifications based on their data needs. For example, the TSSDS table "famgtbuf" contains data about the fauna habitat buffer zones, while the APG table "famgtbuf" contains data about 500 and 1,000 meter buffer zones for Bald Eagle nests and roosts. The attributes in the APG tables that are based on TSSDS are very similar, with a few new attributes. In addition, some of the definitions have been changed to include the specific needs of the base. The new attributes are bolded in Appendix D.

The APG data set includes a few new attribute tables that do not exist in TSSDS. These additional tables are italicized in Appendix D.

The data dictionary printouts in Appendix D contain documentation for the source of the database information. The data documentation also presents the reason for the new APG attribute tables and to which they are linked. These details are important to determine if the additional attributes and/or attribute tables should be added to TSSDS. It is easier for the reviewers of this deliverable to view the data dictionary and supporting data together, rather than flipping back and forth between comparison tables and the printouts. Therefore, a one-to-one comparison between the TSSDS and APG data dictionaries was not conducted. Also, the APG tables that are not based on the TSSDS have very few, if any, attributed in common with TSSDS. Baker will provide recommendations for adding these tables to the TSSDS based on the recommendations provided by the Tri-Service Center from the 90% submittal.

According to Ms. Diedre DeRoia (410-278-0536), APG has considered incorporating the Land Condition-Trend Analysis (LCTA) Data Dictionary into its database. The LCTA was developed by the U.S. Army Construction Engineering Research Laboratories as a standardized method of natural resources data collection, analysis, and reporting. The LCTA has not been added to the APG database so the LCTA was not reviewed as part of this deliverable. However, a copy of this data dictionary is presented in Appendix D for future reference.

Patuxent River Naval Air Station

Mr. Bobby Bean (301-757-1700) from Patuxent River Naval Air Station was contacted to obtain their data dictionary. The data dictionary was reviewed to determine which databases within their data set contained flora or fauna data.

Appendix E.1 presents the flora and fauna attribute tables (DB_TYPE), attributes (FLD_NAME), descriptions (DDDESC), and associated information. Appendix E.2 presents the descriptions of all of the Patuxent River attribute tables. The tables that are included in Appendix E.1 are noted in bold on Appendix E.2. The other table names (non flora or fauna) were included in this appendix for completeness.

A few of the attribute tables appear to be based on TSSDS (i.e., FAHABNES). Therefore, the attributes within these tables were compared to TSSDS in Appendix E.3. The other tables were not compared to TSSDS because they did not match up to any TSSDS tables.

Camp Pendelton

Mr. Jay Cary (760-725-9749) from Camp Pendelton provided Baker with the Camp Pendelton GIS Conceptual Design Draft. This Design Draft indicates that Camp Pendelton's data dictionary was compared to TSSDS Release 1.6 in 1997. Appendix F presents the excerpt of the Camp Pendelton GIS Conceptual Design Draft that details this comparison. The Design Draft also includes potential graphical standards and recommendations for Camp Pendelton to develop their database. Because the Camp Pendelton data dictionary was already compared to the TSSDS for the Design Draft, a comparison to TSSDS was not conducted for this deliverable.

The Design Draft presents the Entity Type Names and definitions from TSSDS that are recommended for inclusion into the Camp Pendelton database. The Design Draft also presents some recommended new Entity Type Names and definitions that are not included in the TSSDS. The Design Draft does not include any recommendations for Attribute Tables, Attributes, or Domains.

The recommendations from the Conceptual Design Draft have not been incorporated into the Camp Pendelton database at this time.

USACE Wala Wala District

Mr. Blaise Grden (509-527-7271) from USACE Walla Walla District was contacted for information on their data dictionary. He indicated that they are trying to follow TSSDS. He also indicated that they would send Baker some information regarding their data dictionary; however, no information has been received to date.

Review and Evaluation of Existing Flora and Fauna GIS Databases for Geospatial Requirements

Integrated Taxonomic Information System

Information on the Integrated Taxonomic Information System (ITIS) obtained at the following Internet address: http://www.itis.usda.gov/itis/. Appendix G contains information on the ITIS that was downloaded via the Internet including the Taxonomic Workbench Users Guide. Mr. Gary Waggoner (303-202-4222) at the United States Geologic Survey (USGS) center for Biological Information in Denver, Colorado, and Ms. Barbra Lamborne (202-260-3643) from EPA were contacted to discuss ITIS.

The ITIS was created to improve the organization of, and access to, standardized taxonomic nomenclature. The goal of the ITIS is to create an easily accessible database with reliable information on species names and their hierarchial classification. The ITIS includes documented taxonomic information of flora and fauna from both aquatic and terrestrial habitats.

The goal of the ITIS is to form partnerships with existing taxonomic list development efforts. The ITIS has formed partnerships with several agencies that manage taxonomic databases that contribute significantly to ITIS. The USGS, Biological Resources Division (BRD) Survey Project developed a checklist of vertebrates of the United States, the U.S. Territories, and Canada. BRD continues to maintain the list. The ITIS will include an update of the original checklist, to which freshwater fish have been added.

The National Oceanographic Data Center (NODC) Taxonomic Code is a system of numerical codes used to represent the scientific names of organisms chiefly in support of archiving oceanographic data. The ITIS also will incorporate all of the NODC data into its database. The PLANTS database is the plant data standard for the ITIS. The PLANTS database is presented in more detail in the following section of this report.

In addition to the above partnerships, several specialists contribute data and expertise,

and are responsible for overseeing changes and additions to the ITIS database. A list of data contributors is presented in Appendix G.

Mr. Waggoner and Ms. Lamborne both indicated that they would not recommend incorporating the ITIS into the TSSDS. The ITIS is a constantly changing database, which currently is updated almost monthly. They said that by the time the ITIS is incorporated into TSSDS and distributed on the CDs, it already would be out of date. In addition, the database would be enormous since it would contain most plant and animal species names in the United States. Therefore, they recommend that a reference should be added to TSSDS to refer the user to the ITIS web page for the most current taxonomic information.

Forest Inventory and Analysis Data Base Retrieval System

Information on the Forest Inventory and Analysis Data Base Retrieval System (FIA) was obtained at the following Internet address: http://www.srsfia.usfs.msstate.edu/scripts/ewdbrs.htm and linked web pages. Appendix H contains information on the FIA that was downloaded via the Internet.

Mr. Brad Smith (202-205-0841) from the U.S. Forest Service was contacted to discuss the FIA. Mr. Smith stated that the FIA monitors forest land across the U.S. including forests on both public and private lands. Currently, there are two primary databases being used by the FIA including the Eastwide and Westwide Forest Inventory Data Base: User's Manuals. In addition, other groups are collecting similar information. Appendix H contains copies of both manuals.

The U.S. Forest Service is under a mandate from Congress to create a Core Manual for collecting data to ensure that agencies and organizations are using the same methods to collect and store data. The mandate requires them to have the Manual completed within six months. Mr. Smith said that the FIA should be

incorporated into TSSDS because many DoD facilities have large forest areas. However, he indicated that the FIA should not be incorporated into TSSDS until the Core Manual is completed since it will be the new standard. The Forest Service then would be able to incorporate data from the bases into their database.

PLANTS

Information on the PLANTS National Database was obtained at the following Internet address: http://plants.usda.gov. Appendix I contains information on PLANTS that was downloaded via the Internet.

Mr. Phil Smith from the Natural Resources Conservation Service (NRCS), Department of Agriculture was contacted on the recommendation from Mr. Peterson to obtain a copy of the PLANTS data dictionary. Mr. Smith indicated that in addition to the PLANTS Database, the NRCS maintains a database called the Vegetative Practice Design (VegSpec). The VegSpec is actually a separate database from PLANTS, although some people may consider it part of PLANTS, and it does contain some similar information. VegSpec, however, is a lot more detailed than the PLANTS database.

The PLANTS database is managed by the NRCS, National Plant Data Center, Baton Rouge, LA. The database includes all native or naturalized vascular plants, mosses, lichen, liverworts, and hornworts known to occur in the United States. The PLANTS database provides individuals with standardized plant names, symbols, and other plant attribute information.

Several federal agencies are using PLANTS including the National Park Service, Natural Resources Conservation Service, Smithsonian Institution, and Fish and Wildlife Service, to name a few. In addition, as presented above, PLANTS is the plant data standard for the ITIS. Since PLANTS is incorporated into the ITIS, the above recommendation to reference ITIS in the TSSDS will include the PLANTS data.

The VegSpec contains data pertaining to particular plant attributes (i.e., tolerance to anaerobic conditions, resistance to burning). The VegSpec contains more than 100 of these attributes for more than 2,000 plant species. A copy of the VegSpec Application Manual is provided in Appendix I. Because these attributes are specific to each plant, and are not the type of data that are typically collected at sites, it is not recommended to include the VegSpec data in TSSDS. Mr. Phil Smith from the NRCS indicated that one useful piece of information that should be collected when plant surveys are conducted on based should be the NRCS soil map unit. A lot of information can be obtained from the soil map unit that may help NRCS to further define some of the plant attributes.